Table of Contents

INSPECTION & STORAGE

The ImPulse III System consists of:

- The ImPulse III Controller in an enclosure
- A liquid level float assembly (stainless float on a stainless steel probe)

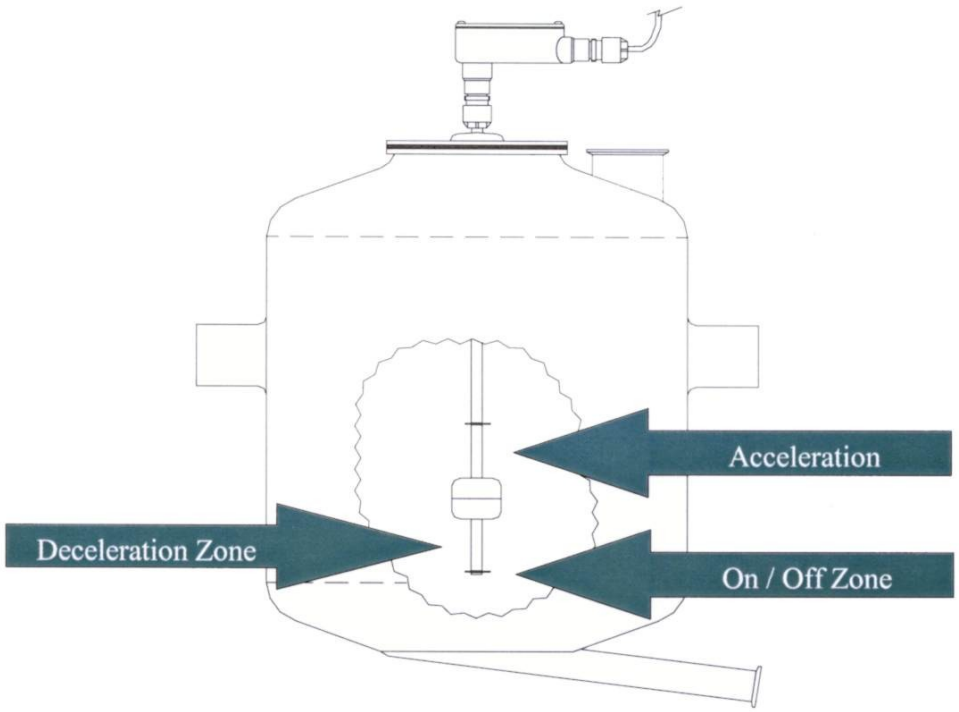
Inspect the ImPulse for shipping damage. If any damage is found, report it to the carrier immediately. Check inside the controller for any visual damage**. Do not attempt to operate the ImPulse if obvious damage exists.**

Storage should be in a clean, dry location. Do not store in an area where the ambient temperature exceeds 149°F or goes below -4°F. Do not store in areas of high condensation or corrosive atmosphere.

IMPULSE CONCEPT

The ImPulse Controller varies the milk pump speed in order to pump the milk through a plate cooler as slowly as possible while still keeping up with milk inflow in the receiver. Usually the pumping rate is significantly less than the maximum, so the cooling efficiency of the plate cooler is increased, resulting in reduced electrical needs for refrigeration. The operational concept of the ImPulse is explained below. This will assist in setting up and troubleshooting a system.

ImPulse uses a float to indicate the milk level in the receiver.



OPERATIONAL SEQUENCE

1) Float is setting on bottom retainer clip; milk pump is off and switch #1 is open.

2) Milk raises float off bottom retainer clip; Switch #1 closes; Milk pump accelerates to minimum speed.

3) Float closes Switch #2; Milk pump continues to run at minimum speed.

4) Inflow of milk exceeds pump-out rate; float rises to top retainer clip; Switch #3 closes; Milk pump accelerates gradually until pump-out rate exceeds inflow (or pump reaches maximum speed). Milk level decreases lowering float; Switch #3 opens; Pump continues to run at the highest speed attained while switch #3 was closed.

5) Milk level drops and lowers float to Switch #2; Switch #2 closes and milk pump speed slowly decreases.

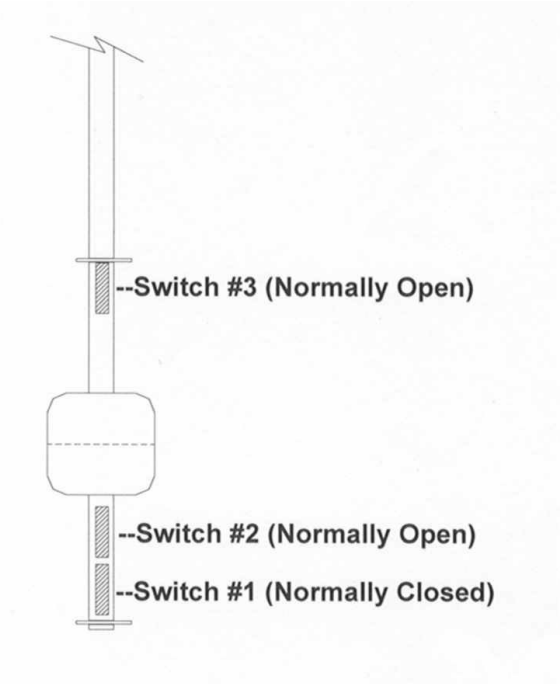
6a) Milk inflow rate exceeds pump-out rate; milk level rises lifting float above Switch #2; Switch #2 opens; milk pump speed continues at the lowest speed attained while switch #2 was closed.

OR

6b) Milk pump speed decreases to minimum speed; Milk inflow and pump-out rate are equal; milk pump continues to run at minimum speed.

OR

6c) Milk pump speed decreases - speed may or may not reach minimum speed; Pump-out rate is greater than milk inflow; Float drops below Switch #2; Switch #2 opens; milk pump speed continues at the lowest speed attained while switch #2 was closed.



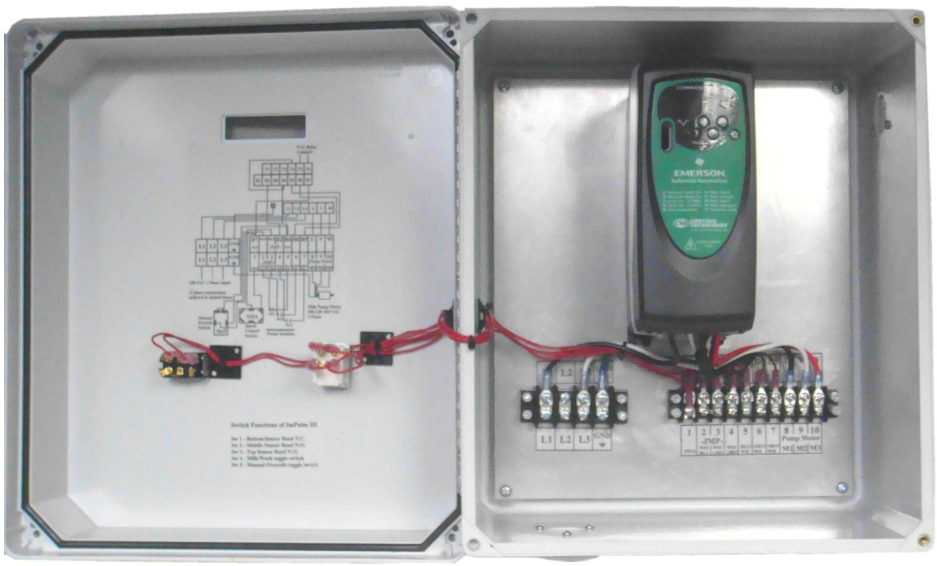
7) Float reaches lower retainer clip; Switch #3 opens; Milk pump turns off.

Ideally, we would like the milk pump to run continuously at a constant speed to obtain maximum cooling. However, in practice this is not possible because of the variability of milk inflow to the receiver.

IMPULSE GENERAL SPECIFICATIONS

The output voltage cannot exceed the mains input voltage.

Output Frequency	0.2 to 400 Hz
Controls	Fully programmable settings for all parameters
Environment:	Enclosure Resistant to low pressure spray from front and sides.
Ambient Temperature:	14°F to 122°F
Humidity:	20% to 95% non-condensing
Fault Protection:	- Over current
	- Under Voltage
	- Drive Over Heat
	- Over Voltage



IMPULSE CONTROLS

Probe Assembly

The liquid level control float assembly has three switches in the stem.

- The upper switch (SW #3, orange wires) closes when the float is in the upper position and causes the inverter to increase the speed of the milk pump motor.
- The middle switch (SW #2, green wires) closes when the float is at that level. This switch is located directly above the lower switch and decelerates the milk pump motor until the minimum speed setting is reached.
- The lower switch (SW #1, blue wires) opens when the float is in the lower position causing the milk pump to coast to a stop.

The probe assembly requires a 1.5" diameter hole in the receiver or receiver lid.

Probe Assembly Length

There are 24" and 30" length probe assemblies to accommodate the different sizes of receiver vessels. Select the proper probe length from the chart below:

Receiver Size	Probe Length
18" x 18"	24"
18" x 24"	24"
26" x 30"	30"
60" x 27"	60"

Float - The float is made of stainless steel construction for a long durable life. One end of the 2” float is marked with an “O”. This end must face up for correct operation. The 1-1/2” float has no markings and therefore can be installed either way.

PANEL SWITCHES

- Speed Control Switch

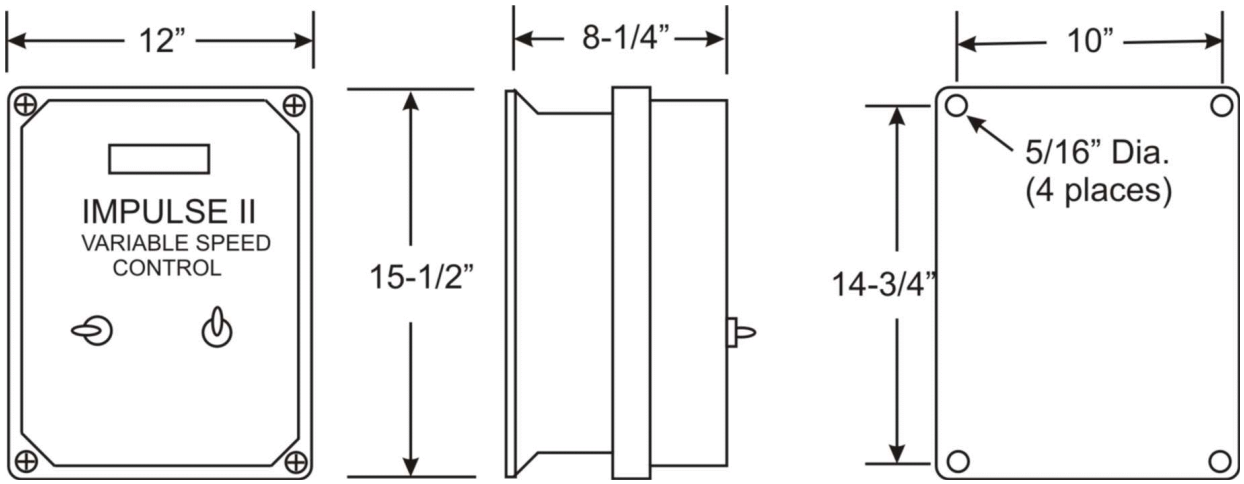
- Variable speed setting - milk pump runs at different speeds depending on the rate of inflow and pumping speed.

- **High** speed setting - milk pump runs at full speed as soon as the float deactivates (lifts off) the lower switch**.**

- Manual Override - This is a momentary switch that when depressed will cause the pump to run at full speed until the switch is released. It is used to empty receiver at the end of milking.

IMPULSE MECHANICAL INSTALLATION

The ImPulse controller is enclosed in a fiberglass enclosure. Both the single and three phase units are the same physical size.



PHYSICAL DIMENSION

- Mounting holes are 5/16" diameter for 1/4" fasteners.
- Allow 6" above, below and in front of the ImPulse controller for cooling air circulation.
- Cable access may be from the sides, top or bottom of the ImPulse enclosure. Cables required are main power in, power out to the motor and cabling to liquid level probe assembly.
- Do not allow any conductive material to enter the ImPulse enclosure or damage may result.
- The ImPulse controller should be located in a vibration free environment.
- The operating temperature range is 32° F to 104° F. Do not mount the ImPulse controller in direct sunlight on hot surfaces or near heat producing equipment.
- Mount the ImPulse controller vertically. This allows natural convection to aid In cooling the heatsink fins on the back of the drive unit.
- The ImPulse controller has a viewing window in the front cover. This shows the status and output of the controller.
- Power should be left on continuously to the ImPulse controller unless performing service. This will aid in keeping the electronics dry.

LOCATION

- If the dairy has a cow ID system, the ImPulse controller should be mounted as close as possible to the milk pump in order to minimize radio frequency interference. Special attention should be give to routing of the shielded power cable to the ImPulse controller to the milk pump motor, keeping the cable as far as possible away from the ID system antennas and communication wiring.

- The ImPulse controller is designed to withstand low pressure washing while providing adequate ventilation for cooling. This should be taken into consideration when locating the controller.

CONNECTING IMPULSE III TO A WASHER PANEL AND PLATE COOLER

System Washing

Some receiver systems may need to have the ImPulse III selected for High Speed Wash if trapping out during the wash cycle when in the Variable Mode. The ImPulse III can be connected to an Automatic Pipeline Washer to kick into the High Speed Wash Mode automatically when the system is high speed washing. You will need a relay with a coil voltage that matches the wash panel's signal voltage to activate the high speed wash mode. You also should use 18/2 shielded cable to connect to the relay and the ImPulse III controller. Connect the 18/2 cable to the 10 pole barrier strip - terminals 1 and 2. Connect to the relay so that when in the wash mode these 2 wires are contacted together to activate the wash mode of the ImPulse III probe and float. This is shown in the Wiring Diagram on page 12 of this manual.

Available relays

24VDC rated coil with 10 amp DPDT contacts. - NP# - R 03522

120VAC rated coil with 10 amp SPDT contacts - NP# - P 05010

120VAC rated coil with 3 amp DPDT contacts - NP# - R 03524

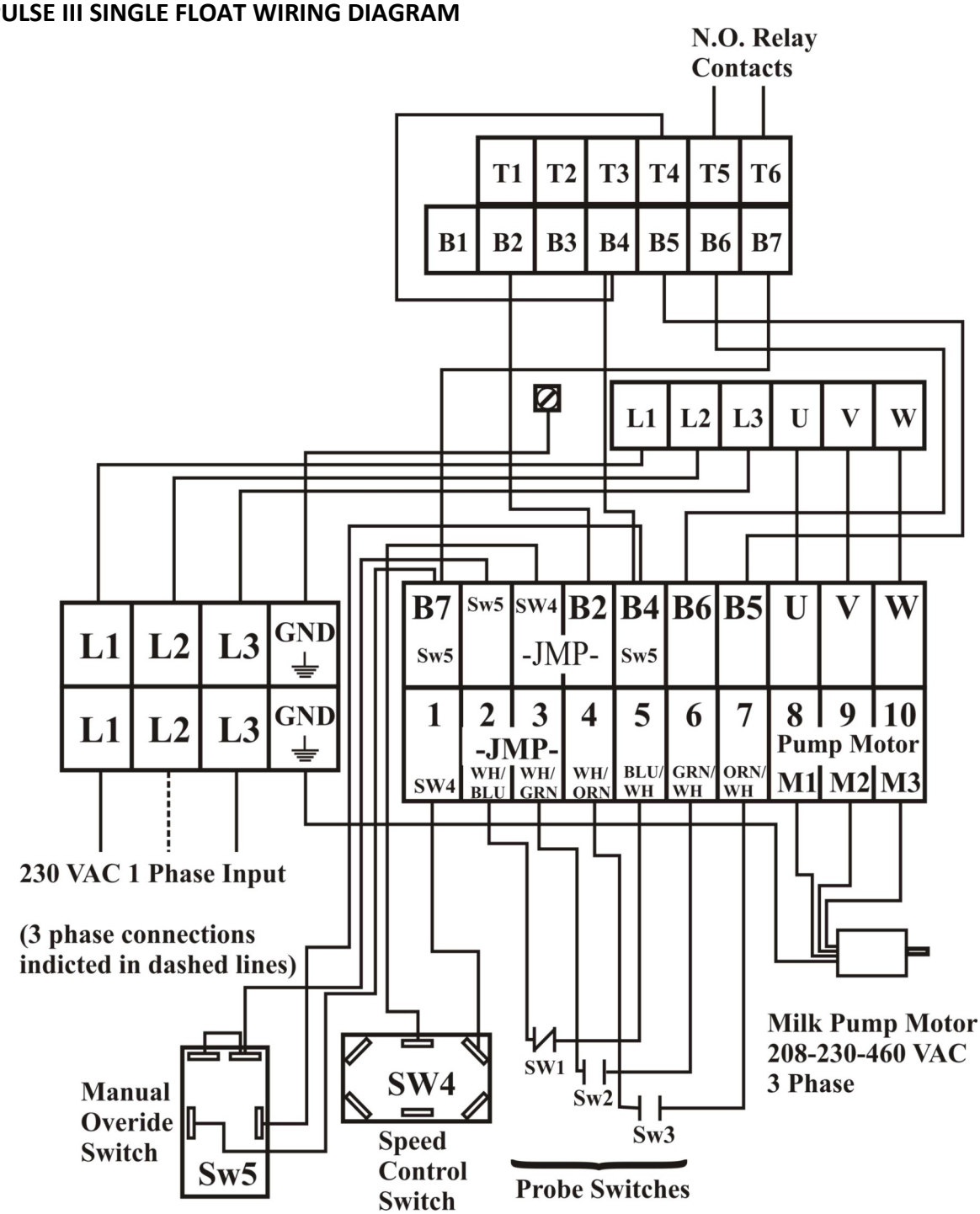
220VAC rated coil with 3 amp DPDT contacts - NP# R 03525

Plate Cooler Water

If you want to save on water going through the Plate Cooler, install a water solenoid valve that the ImPulse III will control. The ImPulse III has a relay contact programmed to activate only when the milk pump is running. The ImPulse III relay is rated for up to 2 amps 240VAC/30VDC. Run one leg of power so that it connects to the ImPulse III Control Unit's relay and back to the water solenoid valve. If you have a washer panel - have the power come from it only when in the **milk mode**. You want to have the plate cooler water off during the **wash mode**. You also should use 18/2 shielded cable to connect to the relay of the ImPulse III controller unit. Connect to terminals T5 & T6 on the Emerson Inverter. This is shown on the Wiring Diagram on Page 12 of this manual.

IMPULSE WIRING

IMPULSE III SINGLE FLOAT WIRING DIAGRAM



WIRE & CIRCUIT BREAKER SIZING

Input

Model	Motor H.P.	Power Wire Size	Motor Wire Size	Circuit Breaker
230 VAC 1 Phase	2 H.P.	16 ga	14 ga shielded	20 Amp
230 VAC 3 Phase	2 H.P.	16 ga	14 ga shielded	16 Amp
480 VAC 3 Phase	2 H.P.	16 ga	14 ga shielded	10 Amp
230 VAC 3 Phase	5 H.P.	12 ga	12 ga shielded	20 Amp
440 VAC 3 Phase	5 H.P.	12 ga	14 ga shielded	16 Amp

NOTES

Use shielded cable from the main breaker panel to the ImPulse and from the ImPulse to the motor. Connect the shield at both ends to earth ground for RFI suppression reasons.

WIRING

It will be necessary to drill holes in the enclosure for the input power, output to the milk pump motor and the cable to the liquid level float assembly. All holes must be fitted with water tight fittings.

1) Wire the Milk Pump motor to the motor terminals (M1, M2, M3) on the terminal block using 14ga shielded cable. Only three phase motors can be used. Make sure that the cable from the ImPulse to the motor is shielded, and that the cable shielding is connected to earth ground at the ImPulse controller and motor. Shielded cable aids in reducing radio frequency interference of other equipment.

2) Wire ImPulse control to the main power panel using the appropriate size wire and circuit breaker as specified in the table above.

3) Installing Probe assembly:

   A 1.5" diameter hole is required in the receiver lid for the Probe Assembly to fit through. Dismantle the float assembly by removing the lower SS retainer that constrains the float. Insert the float stem through the plexi glass receiver cover and press the rubber grommet firmly into the hole. Slide the float over the probe assembly. All 2” floats must be positioned with the “O” mark on the float facing up. The 1 1/2” floats can be put on any direction. Replace the lower retainer into the groove. Position the float in the receiver to avoid the milk entry points. This will minimize float sensing problems during washing caused by turbulence. Connect the float assembly cable to the ImPulse controller as shown in the Control Wiring Diagram.

PROGRAMMING

The ImPulse unit is programmed for use with centrifugal milk pumps, if using on other types of milk pumps such as diaphragm or flexible impeller pumps, contact NuPulse Technical Department for assistance.

Power up

Make sure the float is setting on the lower retainer and apply power to the ImPulse controller. When the unit powers up, it should show "rd 0.0" on the display with the float at the bottom. The pump motor should not begin to run. If it does check the position of the float on the probe. When the float is lifted, the display should change from rd to Fr and show the speed it is running. It is measured in Hz.

Motor Rotation

Remove the receiver lid and probe assembly from the receiver. Dump some water into the receiver to lubricate the pump seals. While looking at the motor fan, briefly lift the float off the lower retainer of the probe assembly to start the motor and note the motor rotation. If the rotation is incorrect, switch wires M1 and M2 on the terminal block in the ImPulse controller. Re-check the motor rotation. Replace receiver cover.

Motor Parameters

You must enter the nameplate amperage for the motor being used into parameters P06. You also need to enter the motor RPM in P07.

Setting Minimum Motor Speed - factory setting = 36 Hz.

The minimum milk pump motor speed should be set slightly above the speed where the pump starts to pump milk. This is determined in the following way:

1) Determine a method to supply water to the receiver while the system is in the milking mode. One suggestion is to use the wash vat and add water line or milking units to supply water. Close all of the shutoff (vacuum or pinch) valves to the milking units. This method is recommended instead of trying to make adjustment during washing as the air injector and lower vacuum levels will effect pump performance.

2) Set the Speed control to high and run water into the receiver . Allow the pump to cycle until the milk discharge line to the wash vat is filled. Re-set the speed control to "Variable".

3) Allow a steady flow of water to enter the receiver so that the milk pump runs continuously at low speed. (Factory setting is 36 Hz.) If additional water is needed, open the shutoff valve to a milking unit.

4) Observe the milk discharge line at the wash vat. Is water being pumped?

If "NO", proceed to step A, otherwise go to step B.

A) Change parameter P01—Low Frequency Limit - to increase the value by one unit. Observe if water is being pumped though the discharge line at the wash vat. Wait 15-20 seconds for system to stabilize. If not, increase data value by one unit. Continue until water just starts to flow from discharge line. Proceed to step 5.

B) If the water is being pumped, proceed as follows:

Change parameter 01 and decrease the data value until the pump stops discharging water into the wash vat, then go to steps 4A.

5) Once minimum pumping speed is determined, increase the data value by one unit and save data to memory.

MILKING SIMULATION

Allow water to flow into the receiver to simulate a group of cows being milked. The milk pump speed should slowly increase when the float gets near the top of it's travel. Then as the float drops below the upper switch (SW #3), the milk pump speed should remain constant until the float activates the middle switch (SW #2) when the pump speed should slowly decrease. This cycle will continue to repeat depending on inflow into the receiver. When water inflow is less than pump outflow, the pump will stop when the float opens the lower switch (SW #1).

WASHING TEST RUN

1) Set the milking system up for washing and set the Speed Control switch on HIGH.

2) Run the system through a wash cycle and check to be sure the milk pump runs at maximum speed (60 Hz) any time the float is off the bottom retainer.

MILKING TIME ADJUSTMENTS

It may be necessary to adjust the acceleration ("P61" factory setting - 60 sec.) and deceleration ("P62" factory setting - 30 sec.) times to optimize the performance of the ImPulse to match the dairyman's milking style. Ideally, we would like the milk pump to run continuously at a constant speed to obtain maximum cooling. However in practice this is not possible because of the variability of milk inflow to the receiver.

1) Have dairyman start milking as normal.

2) Monitor the milk level in the receiver.

3) If the milk pump is cycling up and down rapidly, increase the acceleration time ("E61") by 10 to 15 seconds and repeat observations. Keep in mind the acceleration time is limited by the faster milking group of cows so as not to flood the receiver and trap out.

4) If the milk pump is speeding up and then as the milk is pumped out of the receiver the milk pump shuts off and then restarts after a short pause, the deceleration time should be decreased by 10-15 seconds.

5) If the milk pump rarely speeds up beyond the minimum milk pump speed, repeat the procedure for setting the minimum milk pump speed.

NOTE: Typically the acceleration time will be longer than the deceleration time.

Continue making adjustments until satisfied with the performance.

TROUBLESHOOTING GUIDE

PROBLEM	SOLUTION
Inverter does not power up	1. Input wiring not connected properly or input voltage not within specifications. 2. Check fuses/circuit breaker. Measure voltage at ImPulse input terminals. 3. Check input power wiring. 4. If the fuses have blown then replace them and power up the ImPulse. If the ImPulse runs then possibly lightning or a large power surge caused the fuses to blow. If the fuses blow immediately, then call a service person.
When the float rises to the top position the motor does not increase speed.	**1. If the float is 2" - is the "O" on the float facing the top of the receiver?** 2. **Is Probe Switch #2 (middle switch) shorted closed?** Disconnect Switch #2 (green wires) from the terminal block and measure the continuity while lifting and lowering the float past the switch location. The switch should be closed only when activated by the float. If it is not functioning, replace the probe wire assembly. 3. **Is Probe Switch #3 (upper switch) functioning?** Disconnect Switch #3 (orange wires) from the terminal block and measure the resistance while lifting and lowering the float. The switch should be opening and closing. If not, remove the upper retainer ring and repeat same test moving the float up beyond the retainer ring groove. If Switch #3 works when the float is moved past the retainer ring groove, the wire assembly may not be inserted completely into the probe or the switch needs to be lowered. If it does not work, replace the probe wire assembly.

PROBLEM	SOLUTION
The motor does not start when milk lifts float off lower retainer but manual over ride works.	**Is Probe Switch #1 working?** With speed control set on "Variable", insert a jumper between terminals # 3 and #4. **Does the milk pump run at minimum speed?** If yes, disconnect probe from terminals #3 and #4 (blue wires) and check that Switch #1 (lowest switch) in probe opens and closes as the float is raised and lowered using a multi-meter. If the switch does not work properly, replace probe wire.
The milk pump does not decelerate just stops when it reaches lower retainer ring.	**Does Probe Switch #2 (middle switch) work?** Life the float to the upper retainer and allow the motor speed to increase a few hertz above the minimum, the lower the float to maintain a constant speed. Hold a jumper between terminal #5 can # 6. **Does the motor speed decrease to minimum set speed?** If yes, replace probe wire assembly.
Motor runs continuously with float at lower retainer.	1. **Float not activating Probe Switch #1?** Hold a magnet up to probe in area of Switch #1—did pump stop? If yes, is float right side up: A. Is the "O" on the 2" float facing the top of the receiver? B. Probe assembly not positioned properly. Remove the lower retainer and slide float down. Does pump stop? If yes, probe wire assembly needs to be repositioned. If No, replace the float. 2. **Probe Switch #1 failure?** Disconnect Switch #1 (blue wires from terminal block. If motor stops, replace probe wire assembly.

PROBLEM	SOLUTION
Motor does not run at desired speed.	1. Maximum Speed is less than the Minimum Speed. Check parameter 02—should be set a 60. Parameter 01 should be less than 60—likely in the 30 to 40 range. 2. Motor is overloaded 3. Check float control wiring.
Motor is unstable—cycling frequently.	ACCEL and DECEL times are too short. Increase these times to slow the whole system down which will make it more stable. Refer to "**Test Run"** milking section in the manual; Parameter 61 & 62.

TRIP CODES

Trip Code	Condition	Possible Cause
UV	DC bus under voltage	Low AC supply voltage Low DC bus voltage when supplied by an external DC power
OV	DC bus over voltage	Deceleration rate set too fast for the inertia of the machine Mechanical load driving the motor
OI.AC	Drive output instantaneous over current	Insufficient ramp times Phase to phase or phase to ground short circuit on the drives output Drive requires autotuning to the motor Motor or motor connections changed, reautotune drive to motor
OI.br	Braking resistor instantaneous over current	Excessive braking current in braking resistor Braking resistor value too small
O.SPd	Over speed	Excessive motor speed (typically caused by mechanical load driving the motor)
tunE	Auto tune stopped before completion	Run command removed before autotune complete
It.br	I^2t on braking resistor	Excessive braking resistor energy

Trip Code	Condition	Possible Cause
It.AC	I^2t on drive output current	Excessive mechanical load High impedance phase to phase or phase to ground short circuit at drive output Drive requires re-autotuning to motor
O.ht1	IGBT over heat based on drives thermal model	Overheat software thermal model
O.ht2	Over heat based on drives heatsink	Heatsink temperature exceeds allowable maximum
th	Motor thermistor trip	Excessive motor temperature
O.Ld1	User +24V or digital output overload	Excessive load or short circuit on +24V output
O.ht3	Drive over-heat based on thermal model	Overheat software thermal model
cL1	Analog input 1 current mode, current loss	Input current less than 3MA when 4-20 or 20-4mA modes selected
SCL	Serial communications loss time-out	Loss of communication when drive is under remote control
EEF	Internal drive EEPROM trip	Possible loss of parameter values [set default parameters (see Pr29 on page 31 of Emerson Manual)]
PH	Input phase imbalance or input phase loss	One of the input phases has become disconnected from the drive (applies to 200/400V three phase drives only)
rS	Failure to measure motors stator resistance	Motor too small for drive Motor cable disconnected during measurement
CL.bt	Trip initiated from the control word	Control word has initiated a trip
O.ht4	Power module rectifier over temperature	Power module rectifier temperature exceeds allowable measurement
C.Err	SmartStick data error	Bad connection or memory corrupt within SmartStick
C.dAt	SmartStick data does not exist	New/empty SmartStick being read
C.Acc	SmartStick read/write fail	Bad connection or faulty SmartStick
C.rtg	SmarStick /drive rating change	Already programmed SmartStick read by a drive of a different rating
O.cL	Overload on current loop input	Input current exceeds 25mA
HFxx trip	Hardware faults	Internal drive hardware fault (see *Commander SK Advanced User Guide)*

KEYPAD AND DISPLAY

The keypad and display are used for the following:

- Display the operating status of the drive
- Display a fault or trip code
- Reading and changing parameter values
- Stopping, starting and resetting the drive

Programming keys

The Ⓜ Mode key is used to change the mode of operation of the drive.

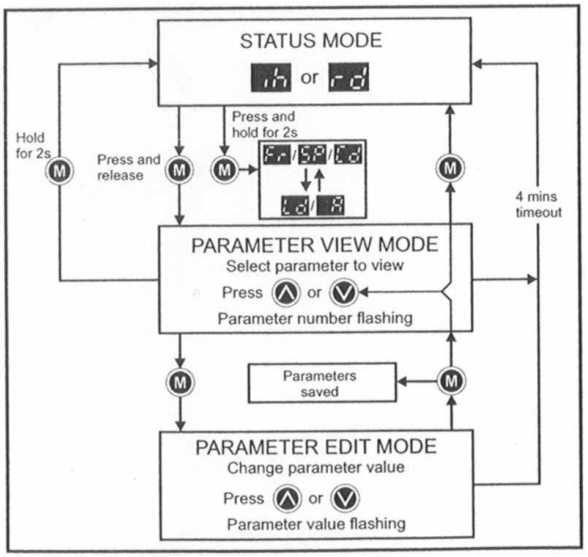
The Ⓐ UP and Ⓥ DOWN keys are used to select parameters and edit their values.

Control keys

The Ⓘ START key is used to start the drive.

The ◯ STOP/RESET key is used to stop and reset the drive.

Selecting and changing parameters



NOTE: This procedure is written from the first power up of the drive and assumes no terminals have been connected, no parameters have been changed and no security has been set.

When in Status mode, pressing and holding the Ⓜ key for 2 seconds will change the display from displaying a speed indication to displaying load indication and vice versa.

Pressing and releasing the Ⓜ MODE key will change the display from status mode to parameter view mode, the left hand display flashes the parameter number and the right hand display shows the value of that parameter.

Pressing and releasing the Ⓜ MODE key again will change the display from parameter view mode to parameter edit mode. In parameter edit mode, the right hand display flashes the value in the parameter being shown in the left had display.

Pressing the Ⓜ MODE key in parameter edit mode will return the drive to the parameter view mode. If the Ⓜ MODE key is pressed again then the drive will return to status mode, but if either of the Ⓐ UP or Ⓥ DOWN keys are pressed to change the parameter being viewed before the Ⓜ MODE key is pressed, pressing the Ⓜ MODE key will change the display to the parameter edit mode again. This allows the user to very easily change between parameter view and edit modes whilst commissioning the drive.

When in parameter edit mode, the Ⓐ UP and Ⓥ DOWN keys are used to change parameter values. This will increase or decrease the parameter value by the minimum unit value on display.

To allow values to be changed more quickly, it is possible to press the Ⓜ MODE and Ⓐ UP or the Ⓜ MODE and Ⓥ DOWN keys together to allow either 1000's of units, 100's of units, 10's of units or units to be adjusted.

EXAMPLE:

It is required that a deceleration ramp of 2500 seconds is required.

Select Pr04 using the normal procedure.

- Press the Ⓜ MODE key to enter parameter edit mode.
- Press the Ⓜ MODE and Ⓐ UP keys together.
- Press the Ⓐ UP key to adjust the 100's of units.
- Press the Ⓜ MODE and Ⓐ UP keys together again.
- Press the Ⓜ DOWN key once to adjust the 10's of units.
- Press the Ⓜ MODE key to go back to parameter view mode.
- Press the Ⓜ MODE key again to go back to status mode.

PROGRAMMING THE EMERSON INVERTER

EZee/NuPulse programs all inverters for Single Float Systems before shipping. These settings are saved on a **Smart Stick** that is included with each ImPulse. The list of Parameter Numbers and Parameter Settings is listed below. **Note*** Must purchase a Smart Stick programmed with settings for the Multiple Float Systems.

Parameter Number Main menu/Actual	Parameter Setting	Description
05/11.27	Pr	Drive Configuration
10/11.44	L3	Parameter Access
01/1.07	36	Minimum Speed
02/1.06	60	Maximum Speed
03/2.11	3	Acceleration Rate to Minimum Hz.
04/2.21	3	Deceleration Rate from minimum Hz to Stop
06/5.07	User Setting	Motor Nameplate Amperage
07/5.08	User Setting	Motor Nameplate RPM
11/6.04	6	Start/Stop Logic
19/1.22	60	Preset Speed 2
61/9.19	6.0	Acceleration time to Max Hz 1.0 = 10 seconds, 3.0 = 30 seconds
62/9.09	3.0	Deceleration time to Min Hz. 1.0 = 10 seconds, 3.0 = 30 seconds
6.40	Off	Enable Sequencer Latching
7.13	On	Analog input 2 invert
7.14	9.28	Analog input 2 destination
8.22	6.30	Terminal B4 digital input destination

Continued

Parameter Number	Parameter Setting	Description
8.23	9.26	Terminal B5 digital input destination
8.24	9.27	Terminal B6 digital input destination
8.27	10.02	Status relay source
9.21	0	Motorized Pot Mode
9.25	1.21	Motorized Pot Destination
12.03	10.04	Threshold Detector 1 Source
12.04	55	Threshold Detector 1 Level
12.06	On	Threshold Detector 1 Output Invert
12.07	12.10	Threshold Detector 1 Destination
12.08	18.11	Variable Selector 1 Source 1
12.09	18.12	Variable Selector 1 Source 2
12.11	9.23	Variable Selector 1 Destination
12.23	9.26	Threshold Detector 2 Source
12.24	50	Threshold Detector 2 Level
12.27	12.30	Variable Selector 2 Source 1
12.28	9.07	Variable Selector 1 Source 2
12.29	9.19	Variable Selector 2 Source 2
12.31	18.12	Variable Selector 2 Destination
12.33	3.195	Variable Selector 2 Source 1 Scaling
12.34	3.195	Variable Selector 2 Source 2 Scaling
18.11	200	Power Down Save Parameters

NOTE: The Inverter must be in the **UNLOCKED** mode to be able to program parameter settings. Also some settings cannot be changed while the Inverter is in the **RUN** Mode. The float must be in the **OFF** position.

IN-FIELD PROGRAMMING PARAMETER SETTINGS

The parameters below must be set in the field. The ImPulse III units are preprogrammed to work with the EZee/NuPulse Float Assemblies.

Number	Main Menu Parameter List	Actual Parameter	Parameter Setting	Parameter Description
1	06	5.07	Motor Name Plate	Motor Rated Current
2	07	5.08	Motor Name Plate	Motor rated RPM

Note: If you want to increase the top end speed of the ImPulse III you must change Parameter 02 - the Maximum Speed in Hz. You will also need to change Parameter 19 - the Preset Speed to the same value.

PROGRAMMING THE INVERTER FROM FACTORY SETTINGS

The Emerson Inverters all come with a “Smart Stick” which is programmed for Single Float System with a backup of the Inverter Parameter settings.

Parameter 29 is used to RESET the Inverter to factory settings. If USA is selected and saved, the Inverter will default to factory settings.

Next go to parameter 10 and set it for “L3” and store.

Next go to Parameter 28 and select READ and save or store. **CAUTION:** When in Parameter 28, do **NOT** select **PROGRAM** or the wrong parameter settings may be sent to the Inverter and you will need to follow the 68 Steps listed to bring the Inverter back to the required settings. It will write the Smart Stick Parameters that EZee/NuPulse programmed into the Inverter memory.

If you are going to use this ImPulse with a Multiple Float System you must purchase a Smart Stick from us preprogrammed for that.. Load the Multiple Float parameters as described above.

Part # R35223NP - Programmed SmartStick for 2HP 220V Impulse Inverter - Multiple Float (Green)

Part # R35442NP - Programmed SmartStick for 2HP 440V Impulse Inverter - Multiple Float (White)

Part # R35447NP - Programmed SmartStick for 5HP 440V Impulse Inverter - Multiple Float (Purple)

MANUALLY PROGRAMMING THE INVERTER

If the Inverter defaults to factory settings and there is no Smart Stick available, then the Inverter can be programmed manually using the following steps to get to the required parameters to run the ImPulse III. The ImPulse settings are shown in red.

Step	Main Menu 0.0 Parameter	Actual Parameter Number	Parameter Setting	Parameter Description
1	05		Pr	Drive Configuration
2	10		L.	Parameter Access
3	01		36	Minimum Speed
4	02		60	Maximum Speed
5	03		3	Acceleration Rate to Minimum Hz
6	04		3	Deceleration Rate from Minimum Hz to Stop
7	11		6	Start/Stop Logic
8	19		60	Preset Speed 2
9	71	00.71	**9.19**	Pr61 Set up Parameter
10	61	9.19	6.0	Acceleration time to Max Hz 1.0 = 10 seconds, 6.0 = 60 seconds
11	72	00.72	**9.09**	Pr 62 Set-up parameter
12	62	9.09	3.0	Deceleration time to Min. Hz 1.0 = 10 seconds, 3.0 = 30 seconds
Note: The balance of the parameters are set using parameters 73 and 63 respectively.				
13	73	00.73	**6.40**	Pr 63 Set up parameter
14	63	6.40	Off	Enable Sequencer Latching

Step	Main Menu 0.0 Parameter	Actual Parameter Number	Parameter Setting	Parameter Description
15	73	00.73	**7.13**	Pr 63 Set up parameter
16	63	7.13	On	Analog input 2 inverter
17	73	00.73	**7.14**	Pr 63 Set up parameter
18	63	7.14	9.28	Analog input 2 destination
19	73	00.73	**8.22**	Pr 63 Set up parameter
20	63	8.22	6.30	Terminal B4 digital input destination
21	73	00.73	**8.23**	Pr 63 Set up parameter
22	63	8.23	9.26	Terminal B5 digital input destination
23	73	00.73	**8.24**	Pr 63 Set up parameter
24	63	8.24	9.27	Terminal B6 digital input destination
25	73	00.73	**8.27**	Pr 63 Set up parameter
26	63	8.27	10.02	Status relay source
27	73	00.73	**9.21**	Pr 63 Set up parameter
28	63	9.21	0	Motorized Pot Mode
29	73	00.73	**9.25**	Pr 63 Set up parameter
30	63	9.25	1.21	Motorized Pot destination
31	73	00.73	**12.03**	Pr 63 Set up parameter
32	63	12.03	10.04	Threshold Detector 1 source
33	73	00.73	**12.04**	Pr 63 Set up parameter

Step	Main Menu 0.0 Parameter	Actual Parameter Number	Parameter Setting	Parameter Description
34	63	12.04	55	Threshold Detector 1 level
35	73	00.73	**12.06**	Pr 63 Set up parameter
36	63	12.06	On	Threshold Detector 1 output invert
37	73	00.73	**12.07**	Pr 63 Set up parameter
38	63	12.07	12.10	Threshold Detector 1 destination
39	73	00.73	**12.08**	Pr 63 Set up parameter
40	63	12.08	18.11	Variable Selector 1 source 1
41	73	00.73	**12.09**	Pr 63 Set up parameter
42	63	12.09	18.12	Variable Selector 1 source 2
43	73	00.73	**12.11**	Pr 63 Set up parameter
44	63	12.11	9.23	Variable Selector 1 destination
45	73	00.73	**12.23**	Pr 63 Set up parameter
46	63	12.23	9.26	Threshold Detector 2 source
47	73	00.73	**12.24**	Pr 63 Set up parameter
48	63	12.24	50	Threshold Detector 2 level
49	73	00.73	**12.27**	Pr 63 Set up parameter
50	63	12.27	12.30	Threshold Detector 2 destination
51	73	00.73	**12.28**	Pr 63 Set up parameter
52	63	12.28	9.07	Variable Selector 2 source 1

Step	Main Menu 0.0 Parameter	Actual Parameter Number	Parameter Setting	Parameter Description
53	73	00.73	**12.29**	Pr 63 Set up parameter
54	63	12.29	9.19	Variable Selector 2 source 2
55	73	00.73	**12.31**	Pr 63 Set up parameter
56	63	12.31	18.12	Variable Selector 2 destination
57	73	00.73	**12.33**	Pr 63 Set up parameter
58	63	12.33	3.195	Variable Selector 2 source 1 Scaling
59	73	00.73	**12.34**	Pr 63 Set up parameter
60	63	12.34	3.195	Variable Selector 2 source 2 Scaling
61	73	00.73	**18.11**	Pr 63 Set up parameter
62	63	18.11	200	Power Down Save Parameters
63	73	00.73	1	Pr 63 Set up parameter
64	63	1	1000	Store Parameters
65	73	00.73	28	Pr 63 Set up parameter
66	63	28	Program	Write Parameters to Smart Stick

Step	Main Menu 0.0 Parameter	Actual Parameter Number	Parameter Setting	Parameter Description
When done Press the RED Reset Key to Activate The above Parameters starting with Step 13 is explained in more detail below. Parameter 73 is where you enter the parameter you want to view or change at the parameter location 63.				
13 thru 65	73	00.73	Enter Parameter # here to set of view in Parameter 63	Pr 63 Set up Parameter used to set all remaining Parameters.
14 thru 66	63	The value of whatever is entered in Parameter 73	The setting for Parameter that is selected in Pr 73. To be viewed or changed.	Parameter 63 is setting to change or view for parameter selected at Parameter 80.

TRIP CODES

The Inverter has a great deal of protection built into its circuitry, and in the event of circumstances which could damage the unit, it is designed to shut off before components are destroyed. When and event occurs which causes it to trip out, it will not restart until the **"STOP/RESET"** key is pushed. The inverter will show an alarm code on the display which will identify the cause of the trip. Refer to Page 19 for a complete listing of trip codes, their meaning and possible resolutions.

EXTENDED WARRANTY AVAILABLE

The Emerson Inverters come standard with an 18 month warranty. You can purchase an additional 3 year warranty coverage for minimal cost any time any time during the original warranty period. For more information contact your EZee/NuPulse sales office and ask for Part # R 03620 for 2 HP Models and # R 03621 for 5 HP Models.